Anterior dental arch shape and human identification: Kieser et al. method applied to 2D-3D dental models in Mexican population

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In this research, Kieser's method was employed to scrutinize whether the anterior dental arch (canine to canine) can be applied to identify a person for forensic individualization. This study was performed in 207 plaster dental models selected from the National Odontological Collection-UNAM; these models were before and after orthodontic treatment. We applied a 2D and 3D (photographs and surface scan) geometric morphometric approach to analyze shape with a biodistance method using principal component and cluster analysis. Both approaches achieved individualization rates above 95% of correct classifications, although 3D was more precise and with less amount of mimicry and incorrect classifications. This pattern of identification is constant even when an orthodontic specialist has treated the individuals. Assembling all the results exposed here, this research supports the anterior dental arch individualization hypothesis in a Mexican sample, as Kieser proposed. It is established that the anterior teeth' incisal surfaces are unique and allow to be used as individualization variables, increasing their likelihood of mimicry or incorrect classifications when they have undergone orthodontic treatment. Consequently, the current research supports the theory of the unique factor in the dental arches, based on a sample and analysis with greater statistical weight, reliance on morphometric methods, contemplating the measurement error, databases for comparison, and the report of the percentage of incorrect classification and mimicry.

Biography

Jorge Jasso-Cuéllar has completed his bachelor´s degree at National Autonomous University of Mexico (UNAM). Realized a short intership at the University of Western Australia (UWA). At the moment working at the Ayotzinapa´s comission at Mexico Goverment.